Range extensions of two frogs, *Cyclorana cryptotis*, *Litoria electrica* and a reptile, *Rhynchoedura ornata* in Queensland

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The Gulf Plains of Northern Australia is one of the most important bioregions of Queensland. Largely intact, the Gulf Plains retains its pre-European vegetation cover and distribution, and is considered one of the most biologically significant and intact biomes in the world (Woinarski *et al.* 2007). However, compared with much of southern and eastern Queensland, the fauna of the Gulf Plains Bioregion in north Queensland is relatively poorly studied. For example, a review of the pattern and gaps in fauna data for the Northern Gulf region (that encompasses the Gulf Plains) revealed that of the 368 5-minute grid cells covering the region, 75% of these cells had no amphibian data and 56% had no reptile data (McDonald and Dawson 2004); a fairly dire situation for natural resource planning for biodiversity.

Amphibians were particularly poorly serviced by available information for the Gulf region, and this is a function of their activity period. Frogs are best studied during and soon after periods of heavy rain (i.e. the wet season), when breeding activity (including calling) is at its peak. This is particularly so for burrowing species, which may be virtually undetectable in the absence of water. However, access to the Gulf Plains Bioregion is limited during the wet season because of the high incidence of heavy clay soils and seasonal inundation of ephemeral streams preventing access even along main highways, and the lack of infrastructure into vast tracts of the region.

As part of on-going surveys into the Gulf Plains bioregion, we were fortunate enough to be located on Huonfels station, a cattle property northwest of Georgetown, during a period of intense storm activity, and thus were able to opportunistically survey the subsequent frog chorus and reptile activity. Therefore, in this note we present extensions to published ranges of *Litoria electrica* Ingram and Corben 1990 and *Rhynchoedura ornata* Gunther 1867 and provide additional information on the range of *Cyclorana cryptotis* Tyler and Martin 1977 and identifying information for *L. electrica*. Additional Queensland records of *Cyclorana manya* van Buerden and McDonald 1980 are also presented. Habitat data for each species is described.

Study area and methods

The entire Gulf Plains Bioregion is contained within the Carpentaria and Karumba geological basins, where it is characterised by extensive alluvial plains with gently sloping sandstone tablelands along its eastern margin (Sattler and Williams 1999). The terrestrial flora consists of mostly open woodlands (dominated by *Eucalyptus*, *Corymbia* or *Melaleuca* spp.) and grasslands. There are also considerable areas of saltmarsh, mudflats, mangroves and sand dunes along the coast (McDonald and Dawson 2004).

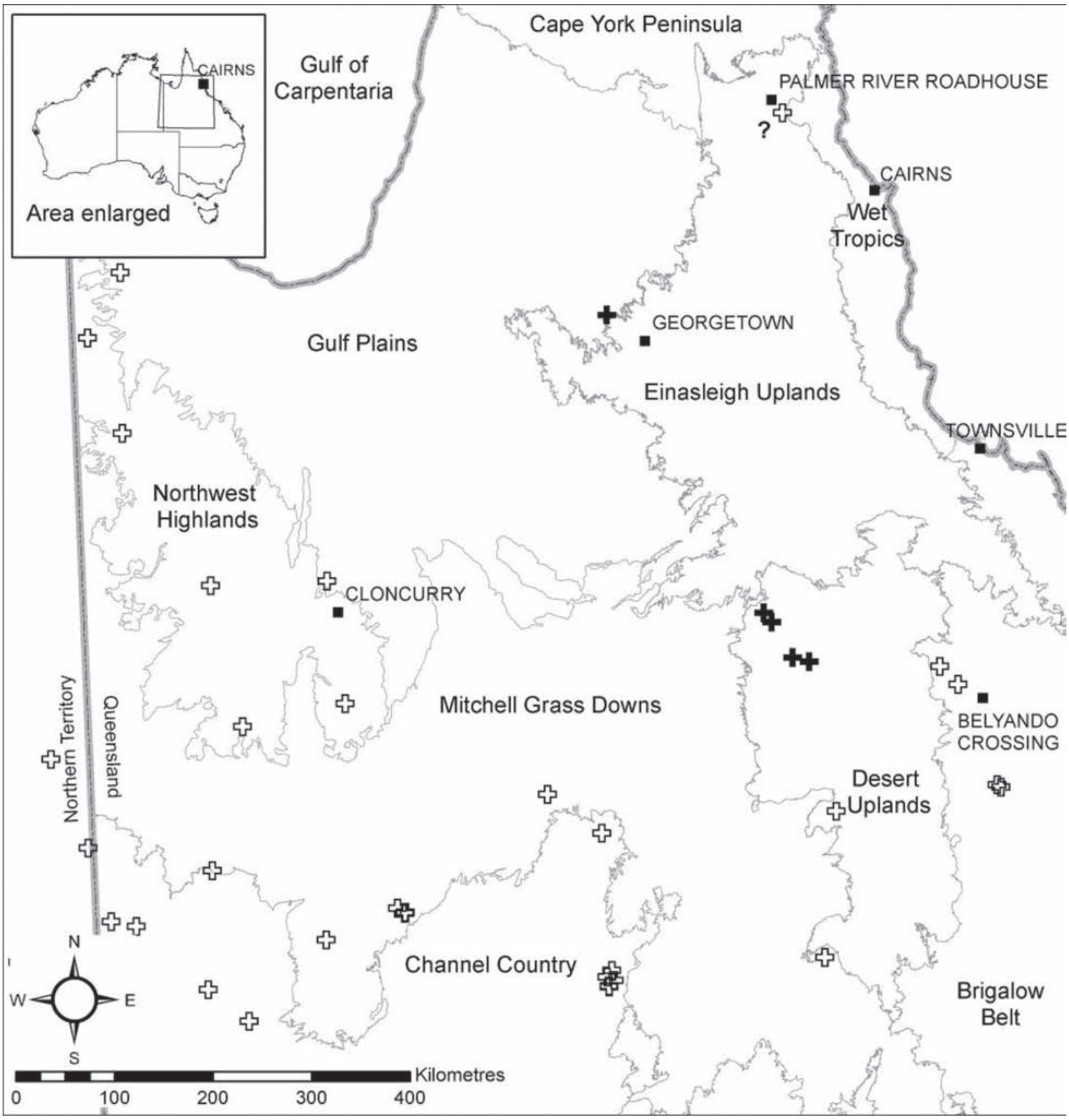
Information presented here was obtained while conducting fauna surveys across the Gulf Plains and Desert Uplands Bioregions. These surveys utilised standardised sampling quadrats that incorporated pitfall, funnel, Elliott and cage traps, and included active searches (nocturnal and diurnal) as part of the standardised effort. Further details on survey methods are described in Kutt and Woinarski (2007).

In addition we examined previously collected material for the two *Litoria* species discussed in this note. This material is lodged in the Queensland Museum, with the specimens examined being: *L. electrica* – J46001, J52708-711, J52711 and J52749; and *L. rubella* – J64887, J68368, J70831 and J72069.

Range extensions

Rhynchoedura ornata

Rhynchoedura ornata is a widespread gekkonid lizard that occupies a variety of inland habitats across central Australia (Cogger 2000; Wilson and Swan 2008; Wilson 2005). In this note we report a specimen from Huonfels station, in the Gulf Plains bioregion bordering on the Einasleigh Uplands. The specimen collected (QMJ85036) is deposited with the Queensland Museum, and was one of two recorded from within several metres of each other. These records substantially add to the known range of *R. ornata*, with most records to the west, south and southeast (Figure 1). A single museum record from near the Palmer River Roadhouse, Cape York Peninsula is likely to be erroneous, possibly as a result of an incorrect AMG reading (Dr Andrew Amey, Queensland Museum). It is not considered further here, although has been included in Figure 1 for reference. The records presented here are over 390 km from the next nearest specimen, to the southwest, near Cloncurry. The habitat from which these new records were obtained was lancewood (*Acacia shirleyi*) forest with emergent *Corymbia serendipita* on a low sandstone plateau with very skeletal soil. A low dense shrub layer of *Dodonaea physocarpa* was present and there was sparse cover of annual grasses, especially *Aristida* sp.


Cape York Peninsula
Gulf of Carpentaria
CAIRNS
Area enlarged
PALMER RIVER ROADHOUSE
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CAIRNS
Wet Tropics
GEORGETOWN
Gulf Plains
Einasleigh Uplands
TOWNSVILLE
Northwest Highlands
CLONCURRY
Mitchell Grass Downs
BELYANDO CROSSING
Desert Uplands
Northern Territory
Queensland
Channel Country
Brigalow Belt
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Figure 1. Distribution of *Rhyncheodura ornata* in Queensland. Solid crosses (✚) show new records presented here. For clarity, only four crosses have been used to represent the 62 records from the Desert Uplands properties. Open crosses (✙) show previous specimen records from museum databases. See text regarding question marked specimen record.

A further 62 individual *R. ornata* were recorded from four properties in the northern Desert Uplands. Unfortunately no voucher specimens were collected, but one individual was photographed (Figure 2). These individuals were recorded from a variety of habitat types, including *Eucalyptus whitei* open woodland on alluvial plains, *E. similis* woodland on coarse sandy plains, and cleared and mechanically thinned areas. Many of the cleared and thinned areas where they were recorded had been sown with buffel (*Cenchrus ciliaris*), suggesting *R. ornatus* may be tolerant of a degree of habitat alteration. These records extend the known range by about 140 km to the west from two previous specimen records in the vicinity of Belyando Crossing, in the northern Brigalow Belt.

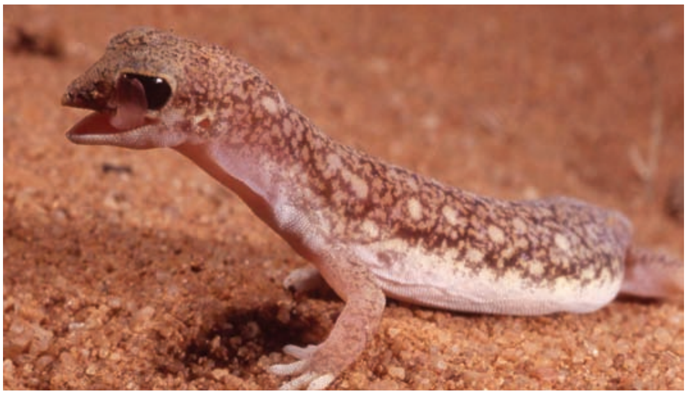
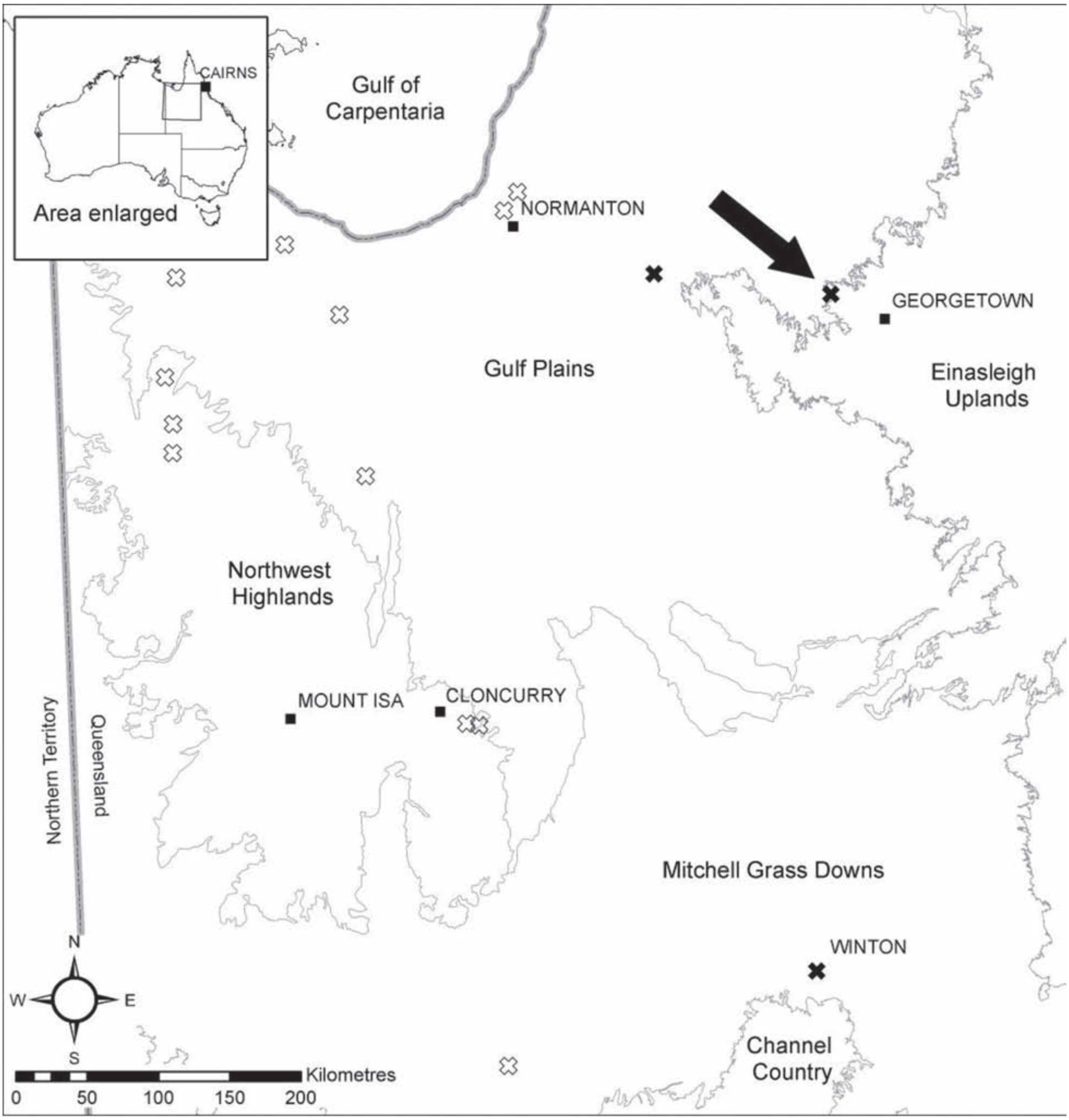


Figure 2. *Rhyncheodura ornata* from Woura Park, northern Desert Uplands.

Rhynchoedura ornata appears to be common in the area surveyed in the northern Desert Uplands. However, with only two individuals observed at Huonfels station, we can not comment on their abundance in that part of their range. While our Huonfels record and two additional previous records (northwest of Cloncurry, and northwest of Doomadgee) fall within the Gulf Plains, it is unlikely that the heavy cracking soils and podsols of much of the Gulf Plains are suitable for this species. It is not known whether *R. ornata* at Huonfels is in range contact with more southern populations of this species.

Litoria electrica

Litoria electrica is a relatively recently described species of hylid frog that closely resembles *L. rubella* (Ingram and Corben 1990). It is currently known from the Gulf Plains, Northwest Highlands and Mitchell Grass Downs bioregions (see Cogger 2000, Barker *et al* 1995). A specimen was recently collected (QMJ85059, Figure 3) and six individuals were also seen, photographed and heard during fauna surveys on Huonfels station. At least five individuals were seen and heard on Oakland Park station, northwest of Croydon. No voucher specimens were collected


CAIRNS
Area enlarged
Gulf of Carpentaria
NORMANTON
GEORGETOWN
Gulf Plains
Einasleigh Uplands
Northwest Highlands
MOUNT ISA
CLONCURRY
Northern Territory
Queensland
Mitchell Grass Downs
WINTON
Channel Country
N
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Kilometres
0
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Figure 3. Distribution of *Litoria electrica* in Queensland. Solid marks (✖) show new records presented here. Open marks (✕) show previous specimen records from museum databases. Arrow indicates location of specimen (QMJ85059).

from Oakland Park, but calling individuals were photographed (Figure 4). The Huonfels records represent a range extension of about 240 km from the previous easternmost records in the Normanton/ Karumba area.

Additional records (two individuals) are reported here from the town of Winton in the Mitchell Grass Downs Bioregion (Figure 3). Found in association with a water tank, no voucher specimens were collected, but one was photographed. These Winton records are over 220 km east northeast of the next nearest record, also from the Mitchell Grass Downs.

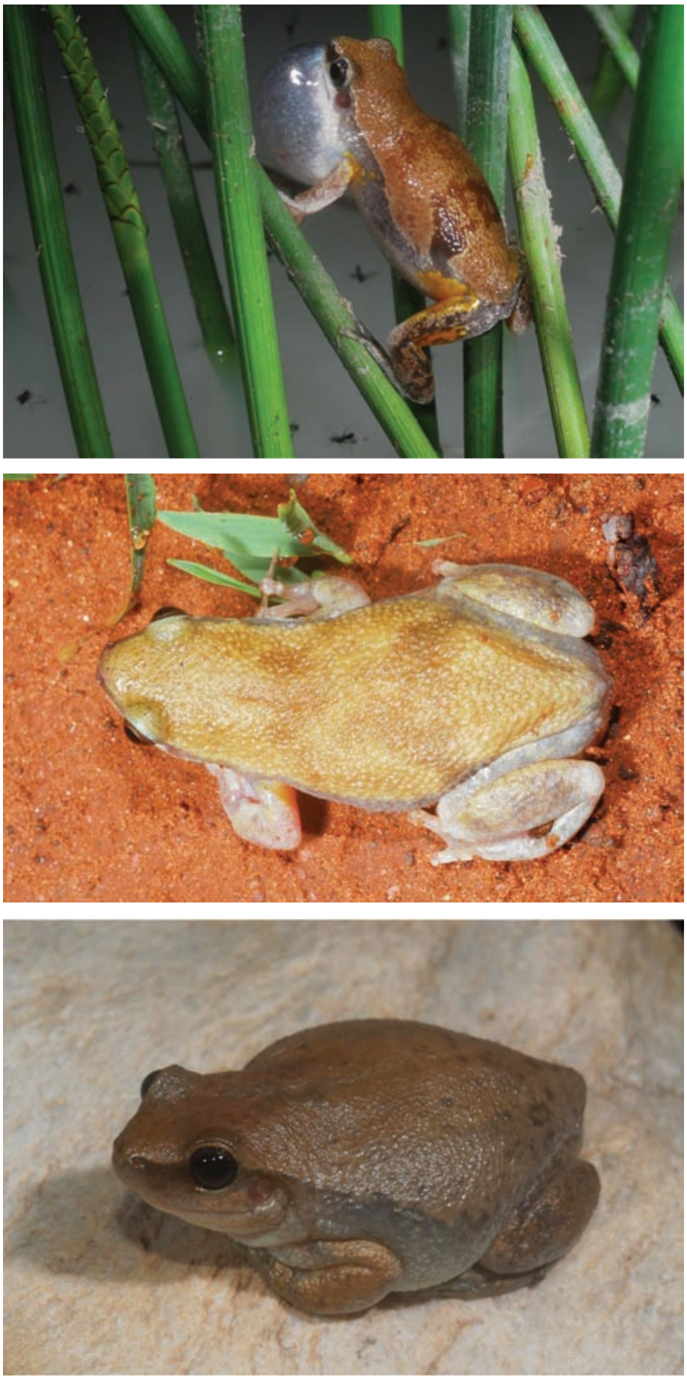


Figure 4. *Litoria electrica*; male calling among water chestnut stems at Oakland Park station (top); obscurely marked male (QMJ85059) showing granular dorsal surface typical of the species (centre); *Litoria rubella* from Mt Isa, northwest Queensland showing less obvious granular surface of this species. Most individuals are less granular than the one shown (bottom).

The Huonfels *L. electrica* were recorded in open *Eucalyptus microneura* woodland interspersed with occasional *Lysiphyllum carronii*. A shrub layer of *Gardenia vilhelmii* and *Carissa lanceolata* was present in many areas. The ground vegetation was dominated by the grasses *Dichanthium fecundum* and *Aristida* sp.

The Oakland Park *L. electrica* were recorded calling from an inundated table drain in open *Melaleuca viridiflora* and *Lysiphyllum carronii* woodland. The ground layer was dominated by thick perennial grasses, predominately *Sarga* sp. Frogs observed were all males and were calling from emergent water chestnut (*Eleocharis dulcis*) stems or hidden in leaf litter in mud on the bank of the drain.

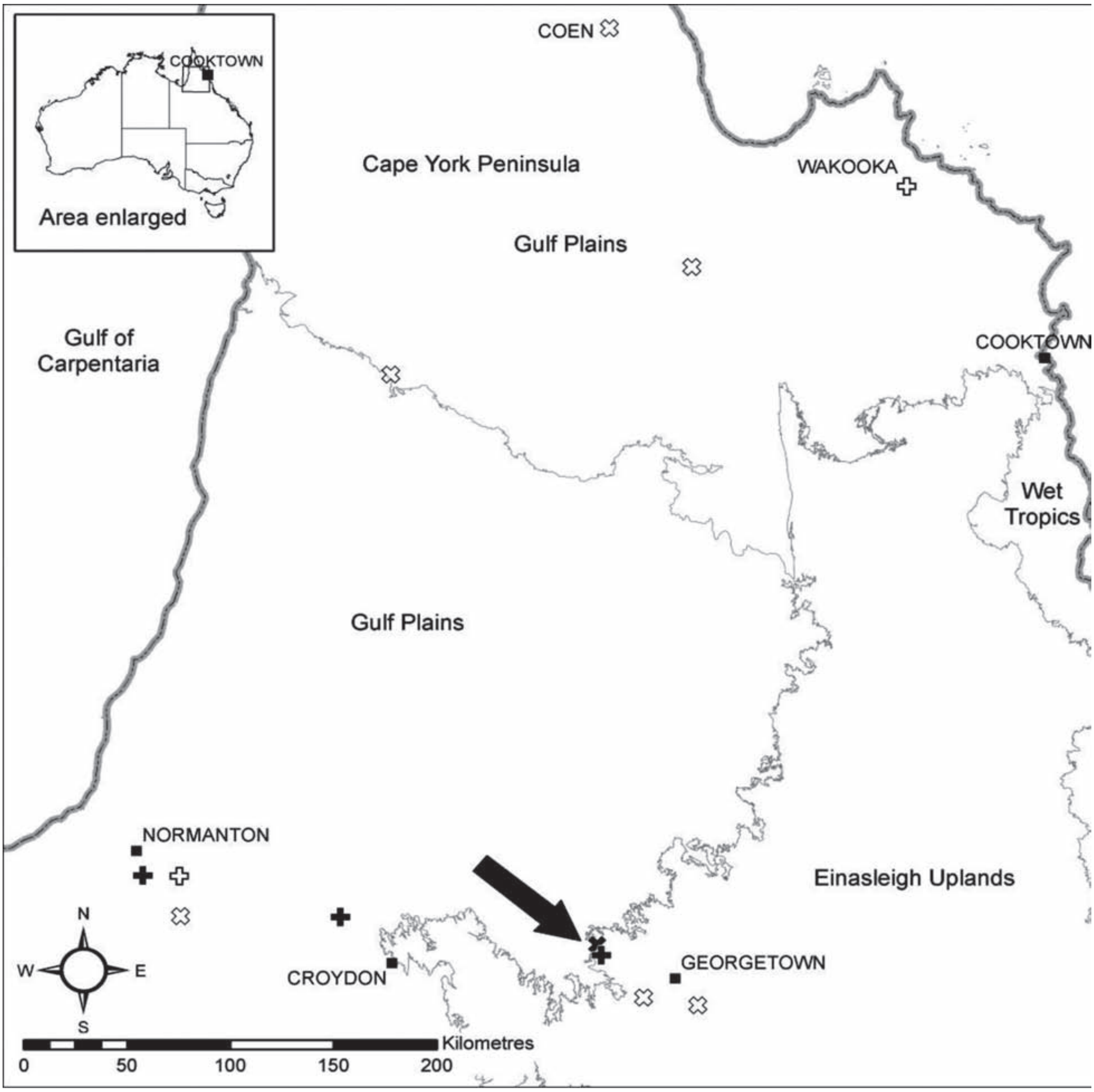
The Winton *L. electrica* were living commensally with human activity, apparently taking advantage of permanent water associated with a leaking water tank. Because of its urban situation, little can be said about *L. electrica* in this area. However, in light of the previous record from grassland downs west southwest of Winton, and a recent record from southwest Queensland in the Channel Country (Vanderduys *et al.* submitted), it seems that *L. electrica* is likely to be very widespread in western Queensland and occur in a wide variety of habitats.

Cyclorana cryptotis

Cyclorana cryptotis is a small terrestrial frog (up to 47 mm SVL, but most are around 40 mm), originally described from Daly Waters, NT and also known from Derby and Kununurra in WA. Two Queensland records exist; one from near Normanton, the other from Wakooka Outstation, Cape York Peninsula (McDonald 1998). *Cyclorana cryptotis* is the only described *Cyclorana* lacking an externally visible tympanum (Tyler and Martin 1976). As such it is easily distinguished from similar sized congeners (in Queensland: *C. brevipes* and *C. manya*). Two recent specimens photographed and collected (QMJ85057 and QMJ85058, Figure 6), from Huonfels station represent a range extension of over 200 km from the Normanton record, and 400 km from the Wakooka record (Figure 5). Huonfels specimens were collected in open quinine bush *Petalostigma banksii* woodland with occasional emergent *Eucalyptus microneura*. Ground layer was sparse and dominated by annual grasses, primarily *Aristida* sp.

A single individual *C. cryptotis* was found crossing a road in Oakland Park station in the vicinity of the *Litoria electrica* described above. This individual was photographed, but not collected as a voucher specimen.

A further three individuals of this species were also observed, but not collected, along a 400 m stretch of the Norman River,13 km south of Normanton. All were observed in scalded sand patches along the banks of the Norman River among gutta percha *Excoecaria parvifolia* low open woodland with a patchy ground layer of salt couch *Sporobolus virginicus* and blue grass *Dichanthium* sp..


COOKTOWN
Area enlarged
COEN
Cape York Peninsula
WAKOOKA
Gulf Plains
Gulf of Carpentaria
COOKTOWN
Wet Tropics
Gulf Plains
NORMANTON
Einasleigh Uplands
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CROYDON
GEORGETOWN
Kilometres
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Figure 5. Point records of *Cyclorana cryptotis* (✚, new records presented here; ✙, previous specimen records) and *C. manya* (✖, new records presented here; ✗, previous specimen records) in Queensland. Arrow indicates location of QMJ85057 and QMJ85058.

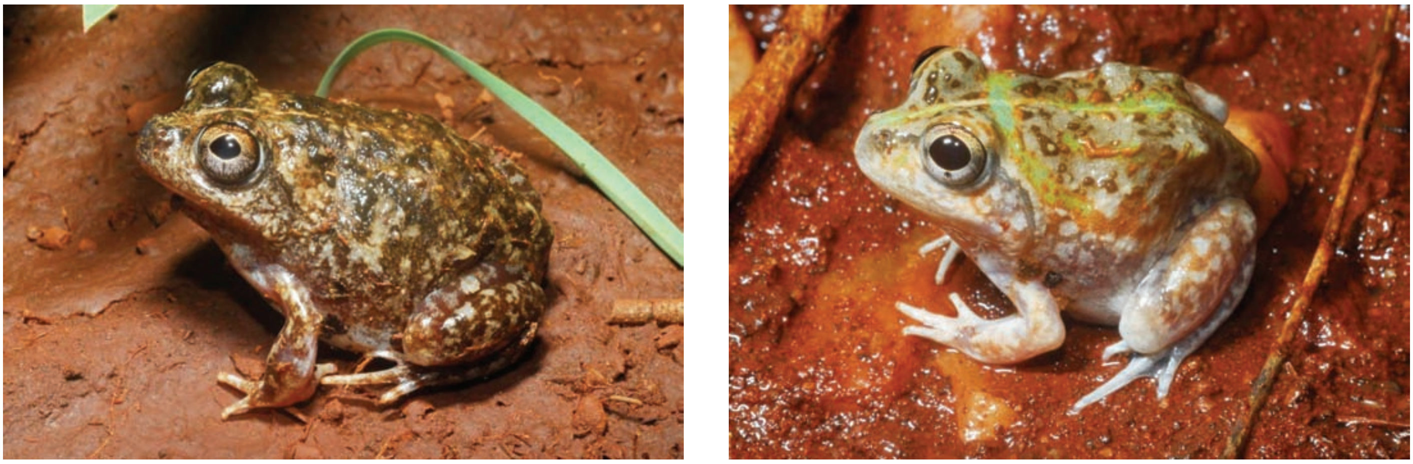

Figure 6. *Cyclorana cryptotis* from Huonfels, Gulf Plains bioregion, showing lack of visible tympana and colour variation (QMJ85057, top; QMJ85058, bottom).

Cyclorana manya

Range maps presented in field guides (Cogger 2000, Barker *et al* 1995) show *C. manya* as being restricted to Cape York Peninsula in the vicinity of Coen. Specimens held in museum collections indicate a wider range, including the Georgetown and Normanton areas (Dr Andrew Amey, Queensland Mueum pers. comm., OZCAM 2009; Figure 5).

Twenty-three individual *C. manya* were seen (and photographed, Figure 7) and heard during survey activities on Huonfels station. However, no specimens were collected. In the field *C. manya* was identified on the basis of their uneven wailing call (compared with recorded calls on Stewart 1998), small size and relatively obscure dorsal markings. *Cyclorana manya* was easily distinguished from *C. cryptotis* by the externally visible tympanum (obscured in *C. cryptotis*). All except four of the Huonfels *C. manya* were recorded in three separate locations within 6 km of each other in open *Eucalyptus microneura* woodland interspersed with *Lysiphyllum carronii*. A variable shrub layer of *Gardenia vilhelmii* and *Carissa lanceolata* was often present. The ground vegetation was dominated by *Aristida* sp. and occasionally *Dichanthium fecundum*. The remaining four individuals were calling from shallow (<3cm depth) inundated grassland dominated by heavily grazed Indian couch (*Bothriochloa pertusa*).

Litoria electrica identification

Litoria electrica is distinguished from *L. rubella* on the basis of call characteristics (higher and generally more evenly pitched in *L. electrica*, usually rising slightly in pitch in *L. rubella*); the nature of dorsal markings (1 – 3 irregular, dark forward-pointing chevrons in *L. electrica* versus obscure markings running upward and forward from inguinal region on rear flank in *L. rubella*); and brown blotches on the posterior of the thighs (present in *L. electrica*, absent in *L. rubella*) (Ingram and Corben 1990).

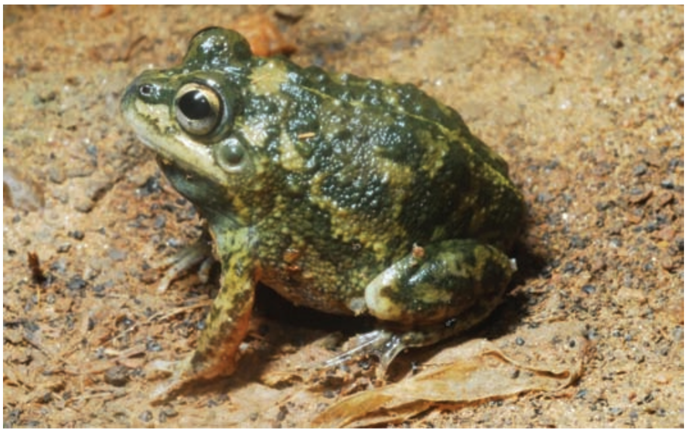

Figure 7. Male *Cyclorana manya* from Huonfels, Gulf Plains bioregion, showing obvious tympanum.

However, in both species, and especially *L. rubella*, dorsal markings can be very obscure. Call characters can not be used when females or non-calling males are encountered. Additionally, both species frequently call side by side (EV unpubl. data) and often stop calling and retreat when disturbed. Consequently, call characters cannot always be used to distinguish males of the two species.

Live specimens examined in the field, and preserved specimens of *L. electrica* all possessed a more evenly granular dorsal surface than did live and preserved *L. rubella*. *Litoria rubella* occasionally has a granular dorsal surface, but the granules are usually of uneven size, and smaller than those in *L. electrica* (Figure 4). This feature readily distinguished between individuals examined in the field that had obscure markings (e.g. QMJ85059, Figure 4 centre) and seems likely to hold for preserved specimens where dorsal marking may have faded (e.g. QMJ52708). It also holds for individuals of both species in the authors' photographic reference libraries and all published pictures we have been able to examine of both species.

Conclusion

These findings emphasise the dearth of basic knowledge of vertebrate fauna across large tracts of North Queensland. There have been few recent systematic inventory surveys in northern Queensland (e.g. Kutt 2004) apart from historical work in the Northern Brigalow Belt bioregion (Lavery 1968; Lavery and Johnson 1968; Lavery and Johnson 1974; Lavery and Seton 1974), Cape York Peninsula (Winter and Lethbridge 1995) and on-going work in the wet tropics (Williams *et al.* 1996).

One key issue is difficulty of access to large areas of the Gulf of Carpentaria catchments. Many of the soils and landscapes are flat, with high clay content, and are seasonally inundated after rains and become largely impassable; exactly the conditions encouraging frog activity and discouraging survey activity. We are therefore not surprised that these species, and particularly *Cyclorana cryptotis* and *Litoria electrica*, should be recorded significant distances from previous collections localities or known ranges. Those who are most likely to come into contact with the species presented here – the landholders – are unlikely to recognise the significance of their find, and perhaps one method to survey difficult to access areas is to encourage the collection of specimens by interested community members.

Acknowledgements

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